

SuperCombi & CombiPlus

Quick Install & Programming Check List for Recreational Power Systems

This check list provide basic programming and commissioning information for your Combi Series Inverter in a Caravan, RV & Marine Applications.

Please make sure you have read and understood the User Manual before attempting to power up you Combi inverter. If you are unsure please contact powertech@jaycar.com.au

This checklist should be used in conjunction with AS 3000 Wiring Rules

Recreations Power System design must comply with you local mandatory requirements, and should follow the recommendations of AS4509.2 SPS Design Guidelines.



Pure Sine Wave

Interactive Inverter Charger

DC Battery Cable – “Battery to Combi”**Checked**

1500W 12V Recommended cable size 0AWG up to 2m
 1500W 24V Recommended cable size 2AWG up to 2m
 3000W 12V Recommended cable size 000AWG up to 2m
 3000W 24V Recommended cable size 0AWG up to 2m

| Model Item | SC-1500-12X | SC-1500-24X | SC-3000-12X | SC-3000-24X |
|-------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| Minimum Battery Capacity (Ah) | 200Ah | 100Ah | 400Ah | 200Ah |
| Recommended Cable Size | 53.5 mm ² 0 AWG | 33.6 mm ² 2 AWG | 85 mm ² 000 AWG | 53.5 mm ² 0 AWG |

NOTE: Consult your battery manufacturer for correct battery sizing for your application.
 Battery cable sizes are based on recommended cable length of 2 meters. Longer cable lengths will require large cable sizes.

DC Battery Fuse Protection – Battery to Combi**Checked** **MAX DC Fuse Size:**

1500W 12V 250Amp
 1500W 24V 125Amp
 3000W 12V 500Amp
 3000W 24V 250Amp

Note:

- *Protection is required on both Positive and Negative cables when the battery is NOT earthed.*
- *Never connect TWO battery banks via a switch.*

Warning Check Polarity.... Before Connection!!

Battery Capacity – Minimum Requirements**Checked**

1500W 12V 200Ah @12V (C10)
 1500W 24V 100Ah @24V (C10)
 3000W 12V 400Ah @12V (C10)
 3000W 24V 200Ah @24V (C10)

Note: *C10 Rate refers to the Amperage discharge over a 10 Hour period.*

AC Wiring Connections to Combi**Checked**

The AC Input Current limit from the AC Generator or Mains Grid supply must be set in the Combi's AC Input Current setting B2-05.

The length of the AC input cable is also required to calculate the correct size that should be used when allowing for maximum input and outputs:

| Inverter AC Input | | | |
|--------------------------|-----------------------------|----------------------------|---------------------|
| SuperCombi® | MCB/RCD | MIN AC Cable Size | |
| | | single Twin-core and earth | |
| Model | MAX Circuit Breaker Current | Enclosed conduit | Unenclosed free air |
| 1500watt | 16Amp | 2.5mm | 1.5mm |
| 3000watt | 32Amp | 6mm | 4mm |
| 6000watt | 63Amp | 16mm | 10mm |

| Inverter AC Output | | | |
|---------------------------|-----------------------------|----------------------------|---------------------|
| SuperCombi® | MCB/RCD | MIN AC Cable Size | |
| | | single Twin-core and earth | |
| Model | MAX Circuit Breaker Current | Enclosed conduit | Unenclosed free air |
| 1500watt | 25Amp | 4mm | 2.5mm |
| 3000watt | 50Amp | 16mm | 10mm |
| 6000watt | 100Amp | 35mm | 25mm |

Note: Never connect the AC supply without the battery connected.

If you are not using the boosting feature from the AC input, you can prevent the Combi from going into over load by using a smaller AC Breaker on the output side of the inverter.

Example: 1500W use 6 Amp, for the 3000W use 10 Amp standard "C-Type" breaker.

Breaker Size recommendations if not using the Boosting feature or AC Generator

| Model | MCB / RCD | Curve Type |
|----------|-----------|-------------------|
| 1500watt | 6 Amps | C-Type (Standard) |
| 3000watt | 10 Amps | C-Type (Standard) |
| 6000watt | 20 Amps | C-Type (Standard) |

B2-01~08: AC Input Voltage & Frequency Input Check Table**Checked****The following Check Table is a summary of the following sections.**

| Setting | Function |
|---------------------|--|
| B2-08=0 | When B1-01=0: Acceptable AC input frequency is 50Hz ± 5 Hz (45~55Hz) |
| | When B1-01=1: Acceptable AC input frequency is 60Hz ± 5 Hz (55~65Hz) |
| B2-08=1 | Accept wide AC input frequency range between 45~65Hz |
| B2-01=190 | AC Low input Cut out Voltage (190VAC) |
| B2-02=197 | AC Low input Cut in Voltage (197VAC) |
| B2-03=255 | AC High input Cut in Voltage (255VAC) |
| B2-04=260 | AC High input Cut out Voltage (260VAC) |
| B2-05= AMPS | AC Input Current (3.33x VA of AC Generator = AMPS) |
| B2-06=1 (Active) | When using a Generator then you must always use wave form check "Active" |
| B2-07=1 | The internal ground relay is closed " <i>Internally the Neutral & GND are joined when in inverter mode only. (AC Out)</i> " |
| B2-09=1 | MODE 2: B2-09=1 Dynamic Power: Dynamic. Used this feature when operating smaller AC Generator less than 3kVA. AC load is supported by the Inverter then slowly pushed across to the Generator. |
| B2-09=0 | MODE 1: B2-09=0 Dynamic Power: Normal. Select Normal when operating larger AC Generators or when connected to Mains Grid. The AC load is supported directly by the AC Generator or Mains Grid. |

B2-08: AC Input Frequency**Checked**

- Check the AC Input and Frequency ranges are set correctly. The default setting is for wide range of voltage and frequency.
- If your system is using a cheaper style generator we recommend you adjust the Combi for a more selective range,

Example: B2-08= 0 (45~55Hz) Narrow range,

B2-08=1 (45~65Hz) Wide range.

B2-01~04: AC Input Voltage**Checked**

- If your system is using a cheaper style AC Generator we recommend you adjust the Combi for a narrower voltage range to offer better protection to your appliances and the Combi. These Voltage input parameters can be adjusted:

Example: LOW: B2-01=190VAC and B2-02=197VAC,

HIGH: B2-03=255VAC and B2-04=260VAC

B2-05: AC Input Current**Checked**

- **It is very important** to correctly program your Combi to suit the size of your AC Generator or Mains Supply!!

If you don't, Power Share, Power Support, Dynamic Power Shifting will NOT work! Furthermore, you can overload your inverter!

- **MODE 1:** Never set the Combi's AC input "B2-05" & B2-18 higher than 16AMPS, we recommend 13~15Amps to avoid tripping of the Shore power breaker. Remember that you MUST be operating in MODE 1 when you are programming these steps.
- **MODE 2:** YOU MUST Never set the Combi's AC input "B2-05" & B2-19 higher than the Continuous output rating of your AC Generator or mains supply. Remember that you MUST be operating in MODE 2 when you are programming these steps.
- Generally, a good rule of thumb is take the AC Generators kVA rated output and multiply it by 3.33, Example: If you have a 3.6kVA AC Generator, then the maximum AC Input Current is $3.6 \times 3.33 = 12$ Amps (11.99).
- We recommend you use this rule to set the AC Input Current to the Combi. This is programmed into B2-05 settings; also check B2-18~21 these should be the same value as set in B2-05. We recommend the use of inverter style AC Generators.
- USE ONLY Mode 2 for AC Generators. and MODE 1 AC Input setting should be 13~15Amps Max 16Amps.
- For more on Mains AC connected systems please refer to the User Manual.

B2-06: AC Input Current**Checked**

- B2-06=1 (Active) When using a Generator then you must always use wave form check “Active”

B2-07: AC Ground Relay (MEN)**Checked**

- B2-07=1 (Closed). For use in Marine and Caravan installations were there is NO MEN point on the AC output then the Ground Relay must be activated. See AS3000 for more info.

Battery Charger Settings**Checked**

- Check that the correct charger voltages have been adjusted to suit your battery.
- Failure to do so can destroy your batteries and could damage the Combi.

Example: PowerStacks SB-1800 & SB-1802 & PowerSleak SB-1822 “AGM” –

24V System

D1-03=26.76 Absorb / Bulk 27.6V

D1-07=23.76 Float 26.76V

D1-10= 0 Equalization charge OFF,

12V System

D1-03=13.80 Absorb / Bulk 13.8V

D1-07=13.50 Float 13.5V

D1-10= 0 Equalization charge OFF,

D1-08 Please DO NOT ADJUST the battery charger current D1-08
Unless you have consulted with us first.

- LV wiring must be installed by a qualified electrical tradesperson
- Safe isolation must be provided between ELV and LV Circuits
- Over-current protection and isolation are rated for AC or DC at the appropriate voltage and currents.
- Shutdown procedure is prominently displayed
- Access to equipment such as batteries is restricted to authorised personnel
- Adequate ventilation is provided to all electrical equipment
- All cables satisfy both voltage drop and current carrying capacity
- All exposed cabling is provided with mechanical protection
- Lighting protection has been provided (if required).
- Equipment is labelled, convenient, accessible and visible
- There are no live parts accessible on any installed equipment.
- Main Battery over-current protection installed in all un-earthed conductors
- A means to readily isolate the battery bank is installed
- The batteries are installed in an appropriate ventilated dedicated room, enclosure or restricted access area designed to prevent unauthorised entry
- “Warning- Spark Hazard” sign is mounted above or next to the batteries
- Battery warning signs “DANGER – Risk of Battery Explosion and Electrolyte Burns” are clearly visible.
- There are NO arc producing devices in the area.
- ELV cables are to be labelled to identify solar, and DC circuits, and cabling.

EXAMPLE: Power System-320 Watt Solar Schematic

